

Patent Claims

1. A handling device for wafers (semiconductor disks) or other disk-like substrates, which has a storage device in which a plurality of wafers can be arranged with their surfaces aligned substantially parallel to one another, one behind another and outside a transport container, is provided with a gripping device with which individual wafers can be removed from the storage device and/or inserted into the latter, characterized in that the gripping device (43) has a plurality of grippers (44, 60) which can be moved together but can be actuated independently of one another, it being possible in each case for at least one wafer to be gripped and/or inserted into the storage device (42) as a result of the actuation of a gripper (44, 60).
2. The handling device as claimed in claim 1, characterized in that the number of grippers (44, 60) of the gripping device (43) corresponds to the number of wafers in a wafer batch or an integer multiple thereof.
3. The handling device as claimed in one or both of the preceding claims, characterized in that grippers (44, 60) of the gripping device (43) are arranged on a common carrier (61) which can be moved parallel to the storage device (42) on a guide element (62).
4. The handling device as claimed in one or more of the preceding claims, characterized in that grippers (44, 60) can be pivoted into two end positions, being located in a first end position in an empty position and in a second end position in a transport position for wafers of the gripping device (43), in which they

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transport wafers substantially parallel to the storage device (42).

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fig 6
5. The handling device as claimed in claim 4,
5 characterized in that the pivoting movement of the
respective gripper (44, 60) takes place in a plane
which is aligned substantially orthogonally to the
direction of movement of the gripping device (43) and
parallel to the surfaces of the wafers of the storage
10 device.

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6. The handling device as claimed in one or more of
the preceding claims, characterized in that grippers
(44, 60) of the gripping device (43) can be moved
15 rectilinearly, substantially parallel to the surfaces
of the wafers and transversely with respect to the
direction of movement of the gripping device (43)
independently of other grippers (44, 60) of the
gripping device, being located in a first end position
20 in an empty position and in a second end position in a
transport position for wafers of the gripping device
(43), in which they transport wafers substantially
parallel to the storage device (42).

25 7. The handling device as claimed in one or more of
the preceding claims, characterized in that it is
possible to insert into the storage device (42) a
number of wafers which at least substantially
corresponds to an integer multiple of the number of
30 wafers which can be handled simultaneously by the
gripping device (43).

8. The handling device as claimed in one or more of
the preceding claims, characterized ~~by a transfer~~
35 station (40) arranged in the travel path of the
gripping device (43) and having a temporary store for
wafers, in which a plurality of wafers can be arranged

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with their surfaces parallel to one another, it being possible to use the gripping device (43) to transfer wafers from the storage device (42) to the transfer station (40) and vice versa.

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9. A gripping device for handling a plurality of wafers or other disk-like substrates, which has a plurality of grippers (44, 60) each gripper (44, 60) being provided for at least one wafer, it being possible for the wafers to be arranged parallel to one another in the grippers (44, 60), for the grippers to be moved together but actuated independently of one another, and in each case for at least one wafer to be handled as a result of the actuation of a gripper (44, 60).

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10. A storage device for temporary storage of wafers or other disk-like substrates, which has a housing which forms an interior space in which there are a plurality of storage locations for transport containers of wafers, the storage device is provided with a manipulator which handles the transport containers, characterized in that at least part of the interior space is designed as a clean-room area, in which wafers can be handled outside transport containers and can be stored temporarily in a storage device (42) and there is at least one gripping device (43) which has a plurality of grippers (44, 60) which can be moved together but can be actuated independently of one another, it being possible in each case for at least one wafer to be gripped and/or inserted into the storage device (42) as a result of the actuation of a gripper (44, 60).

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IMD 35 11. The storage device as claimed in claim 11, characterized by a handling device as claimed in one or more of the preceding claims 2 to 8.

12. A method of assembling a wafer batch, in which first of all wafers are arranged in a storage device as an initial wafer stack, individual wafers are then removed from the initial wafer stack by a gripping device and are arranged again in a predetermined order, characterized in that, firstly, a plurality of wafers (48) (48) are removed from the storage device (42) one after another by the gripping device (43) and only then are the wafers removed by the gripping device (43) passed on to the storage device (42) or to a holding device differing from the latter.

13. The method as claimed in claim 12, characterized in that the gripping device (43) is arranged in a specific position with respect to the storage device (42), the gripping device (43) removes a plurality of wafers (48) from the initial wafer stack in this position, the gripping device (43) is moved into at least one other position and passes on these wafers one after another to the storage device or to a holding device differing from the latter.

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14. The method as claimed in claim 12 or 13, characterized in that the gripping device (43) grips wafers (48) of a wafer batch arranged in a transfer station, sets down the wafers (48) at storage locations belonging to the storage device (42) and stores the positions of each of the wafers (48) in the storage devices (42), together with data for the identification of the batch in which the wafer was previously located and/or data with respect to processing processes already passed through by the respective wafer.

15. The method as claimed in one or more of the preceding claims 12 to 14, characterized in that the gripping device (43) moves substantially parallel to a stack direction of the wafers

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between the removal of a first and the removal of
a last wafer (48).

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